TTS-8000

UK Model

DIRECT DRIVE TURNTABLE

SPECIFICATIONS

GENERAL

Power Requirements: 220 or 240V ac, 50/60 Hz
Power Consumption: 14 W
Dimensions: Approx. 370 (w) x 130 (h) x 395 (d) mm
14 $^{9}/_{16}$ (w) x 5 $^{1}/_{8}$ (h) x 15 $^{9}/_{16}$ (d) inches
including projecting parts and controls
Weight: Approx. 9.9 kg, 4 lb 8 oz (net)
Approx. 11.5 kg, 5 lb, 3 oz (with shipping carton)

TURNTABLE

Platter: 32cm (12 $^{5}/_{8}$ inches), diecasting aluminum alloy
Drive System: DC servo-controlled motor (brushless and slotless) direct drive, crystal lock control system

Speeds: 33 $^{1}/_{3}$, 45 rpm.
Speed Control Range: ±4% (crystal lock switch OFF)
Starting Characteristics: at nominal speed within a third revolution (33 $^{1}/_{3}$ rpm.)
Wow and Flutter: ±0.04% (DIN), 0.025% (WRMS)
S/N Ratio: Greater than 70 dB (DIN-B)

	Position of the Crystal Lock Switch	
	ON	OFF
Initial drift	within 0.0005%	within 0.1%
Load characteristics (at 3 g tracking-force)	0%	less than 0.05%
Speed deviation	within 0.003%	variable

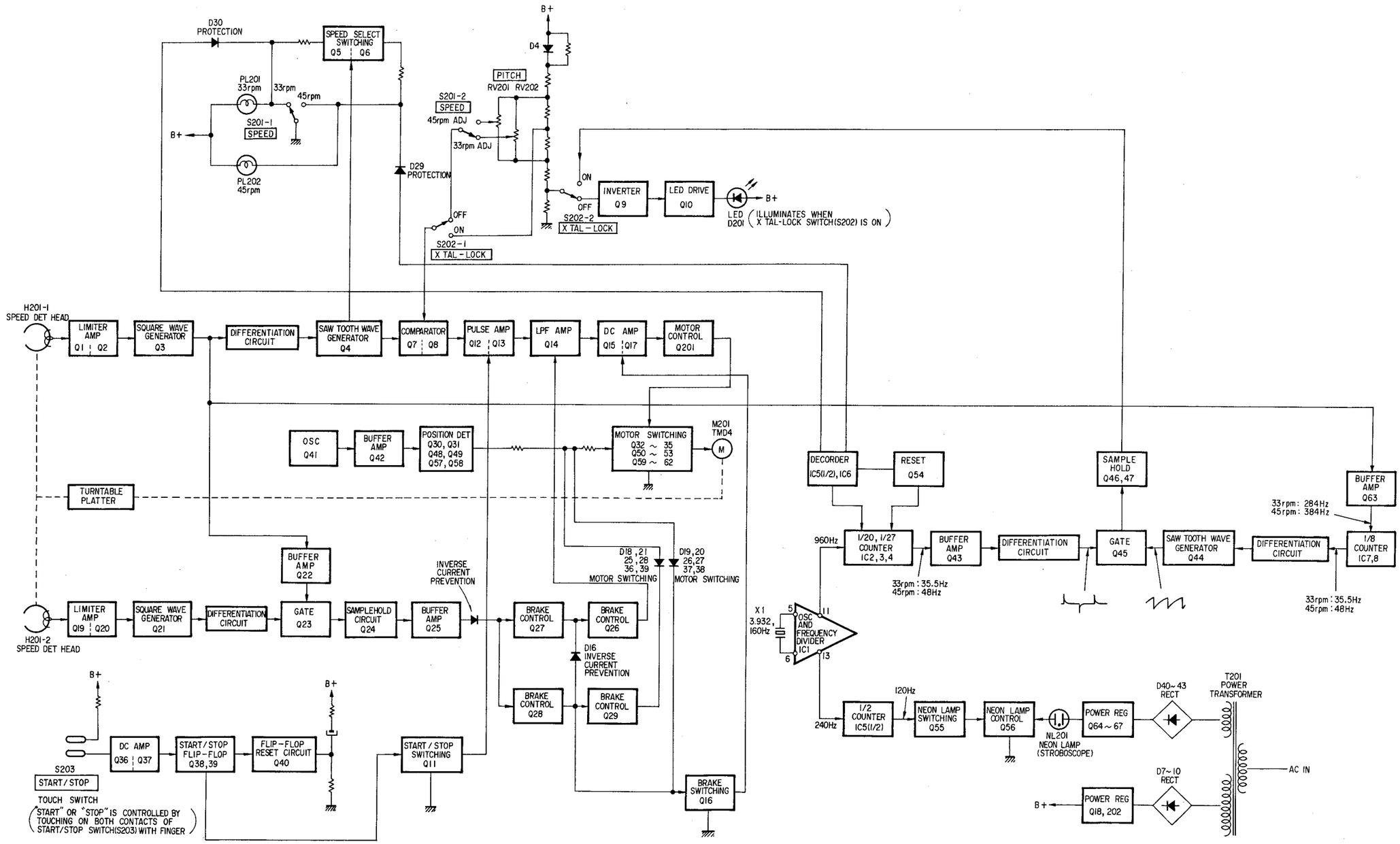
SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SONY

SERVICE MANUAL

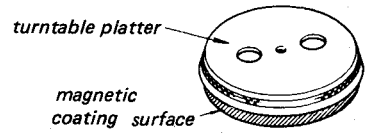
SECTION 1
BLOCK DIAGRAM



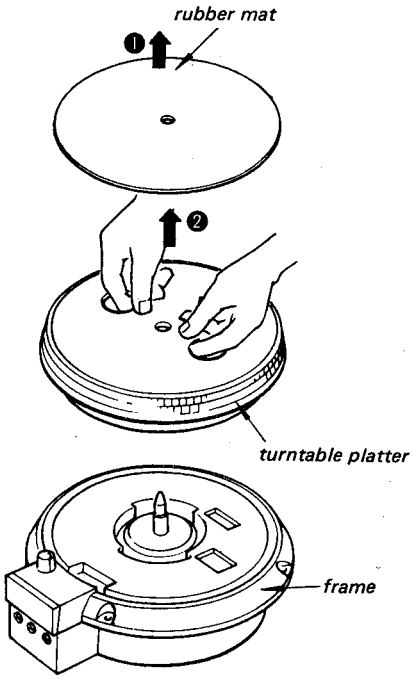
SECTION 2
DISASSEMBLY

CAUTION:

- Do not bring a magnetized screwdriver close to the magnetic coating surface.

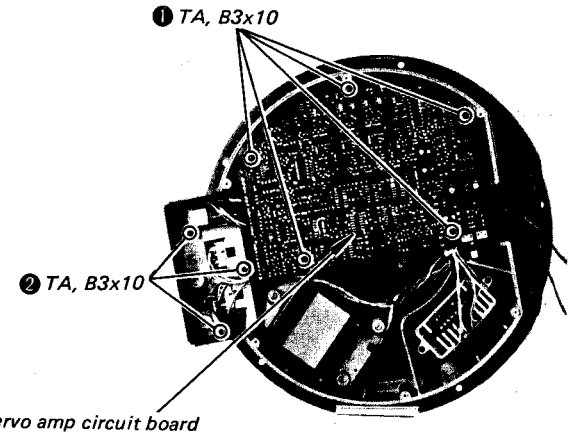


Turntable Platter Removal

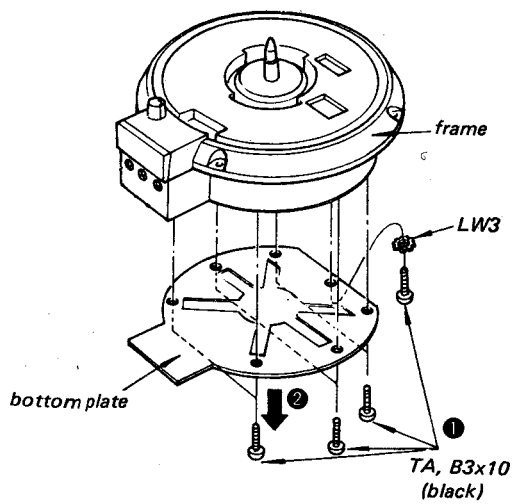


Servo Amp Circuit Board and Control Section Removal

❶ : Servo Amp Circuit Board
❷ : Control Section



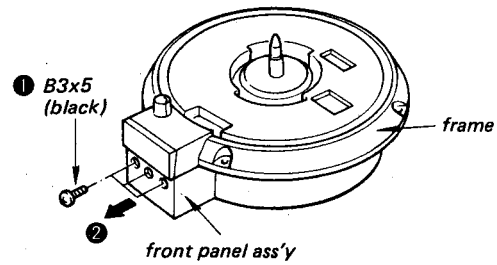
Bottom Plate Removal



Replacement

- Neon Lamp (with lamp holder)
- SPEED Switch
- XTAL-LOCK Switch
- Pilot Lamp
- LED

Front Panel Removal

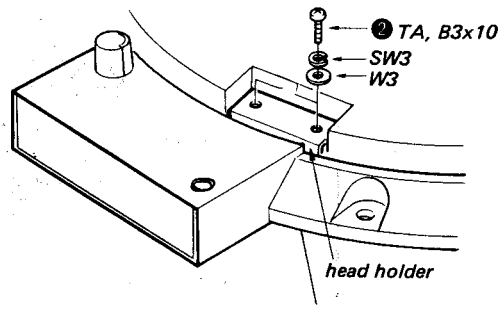


Replacement
- Microswitch (POWER)
- Variable Resistor (PITCH)

Speed Detecting Head Removal

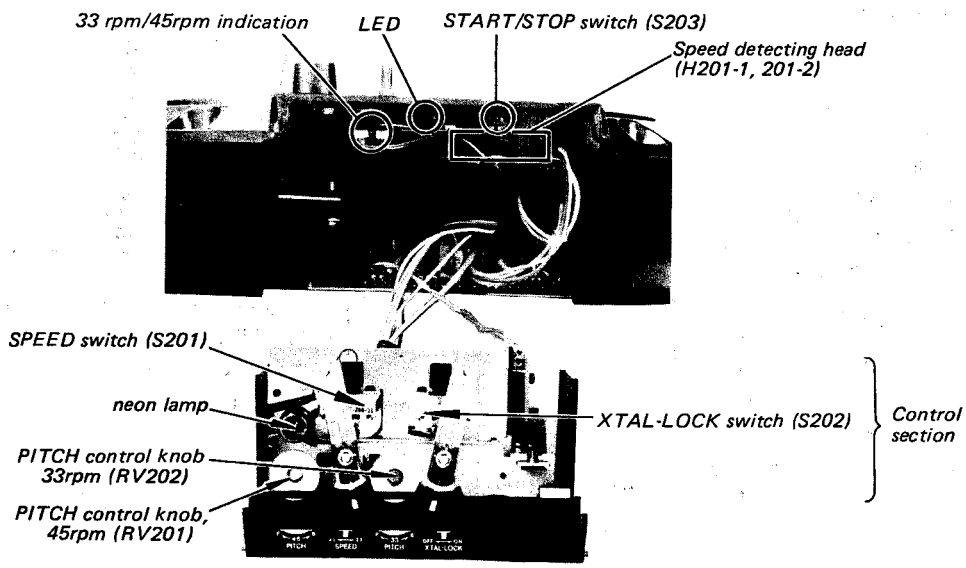
(Replace the speed detecting head with head holder.)

❶ *Unsolder the speed detecting head lead wires.*



Note: *After replacing the speed detecting head, adjust speed detecting head position on page 7.*

Layout



SECTION 3
ADJUSTMENTS

3-1. SPEED DETECTING HEAD POSITION ADJUSTMENT

When replacing the speed-detecting head and the turntable platter, adjust them as follows. Maladjustment results in insufficient servo operation or abnormal wow-flutter characteristics.

Procedures:

1). Remove the turntable platter. (on page 5)
2). Remove the control section. (on page 5)
3). Position the head holder in the direction shown by the arrow in Fig. 1 sufficiently. Fix the head holder (assembled with the speed detecting head) to the frame temporarily.

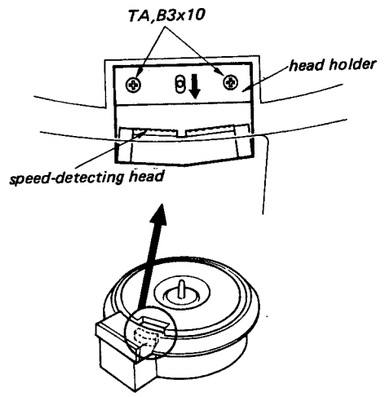


Fig. 1

4). Adhere the card (approx. 0.3mm thick) onto the magnetic coating surface of turntable platter as shown in Fig. 2.

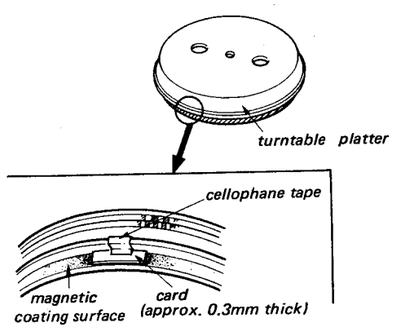


Fig. 2

5). Install the turntable platter with the card faced to the heads.
6). Move the head holder to the turntable platter side so that the two heads evenly contact the card.
7). Remove the turntable platter carefully, and then secure two setting screws of the head holder.
8). Remove the card from the turntable platter, and confirm that the turntable platter does not contact the head after installing the turntable platter again.
9). Turn the power switch on. Confirm that the stripe of stroboscope seems to be stopped at speeds of 33 rpm and 45 rpm. Confirm that the output level is 30 to 60 mV ac on the VTVM connected to the terminal of head, and also the output level of two heads is almost the same. If not, readjust the position of the head holder.

3-2. TURNTABLE SPEED ADJUSTMENT

If correct speed cannot be obtained by adjusting the pitch controls, adjust R16 and R18.

1). Set the two pitch control knobs (33 and 45) to the mechanical-mid-position.
2). Adjust R16 (33 rpm) and R18 (45 rpm) so that the stroboscope pattern appears stationary.

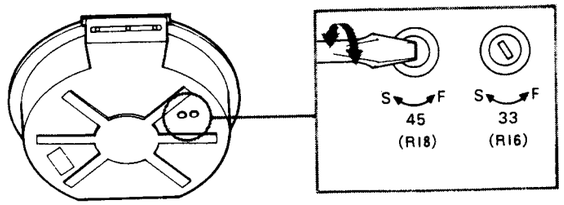


Fig. 3

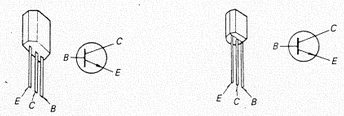
SECTION 4
DIAGRAMS

4-1. MOUNTING DIAGRAM

– Conductor Side –

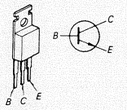
Semiconductors
For replacement, use semiconductors except in ( ).

Q1~4, 7~11 :
14~16, 18~33 :
36~51, 54, 55 :
57~60, 63, 65 :
68 : } 2SC634A (2SC945)

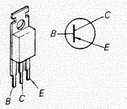


Q5, 6 :
12, 13 :
17 : } 2SA678 (2SA733)

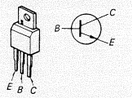
Q34, 52, 61:
201, 202 : } 2SC1061



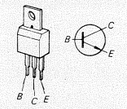
Q35, 53 :
62 : } 2SA671



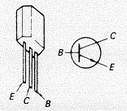
Q56: 2SC1127



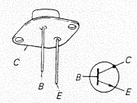
Q64: 2SC1760



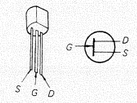
Q66: 2SC926A



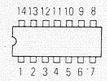
Q67: 2SC1431



Q69: 2SK30A



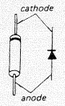
IC1: MSM5576
IC2, 4, 5, 6, 7, 8: M53200P
IC3: M53210P
IC6: M53220P



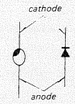
(Top view)

D1~3 :
5 :
11~34:
36~39: } 1S1555

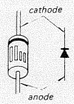
D7~10 :
35 :
40~43: } 10E2



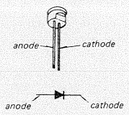
D4: MV5L



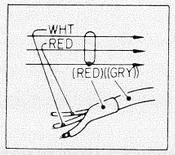
D6, 44: EQB01-06
(EQA01-06S)



D201: SLP24B

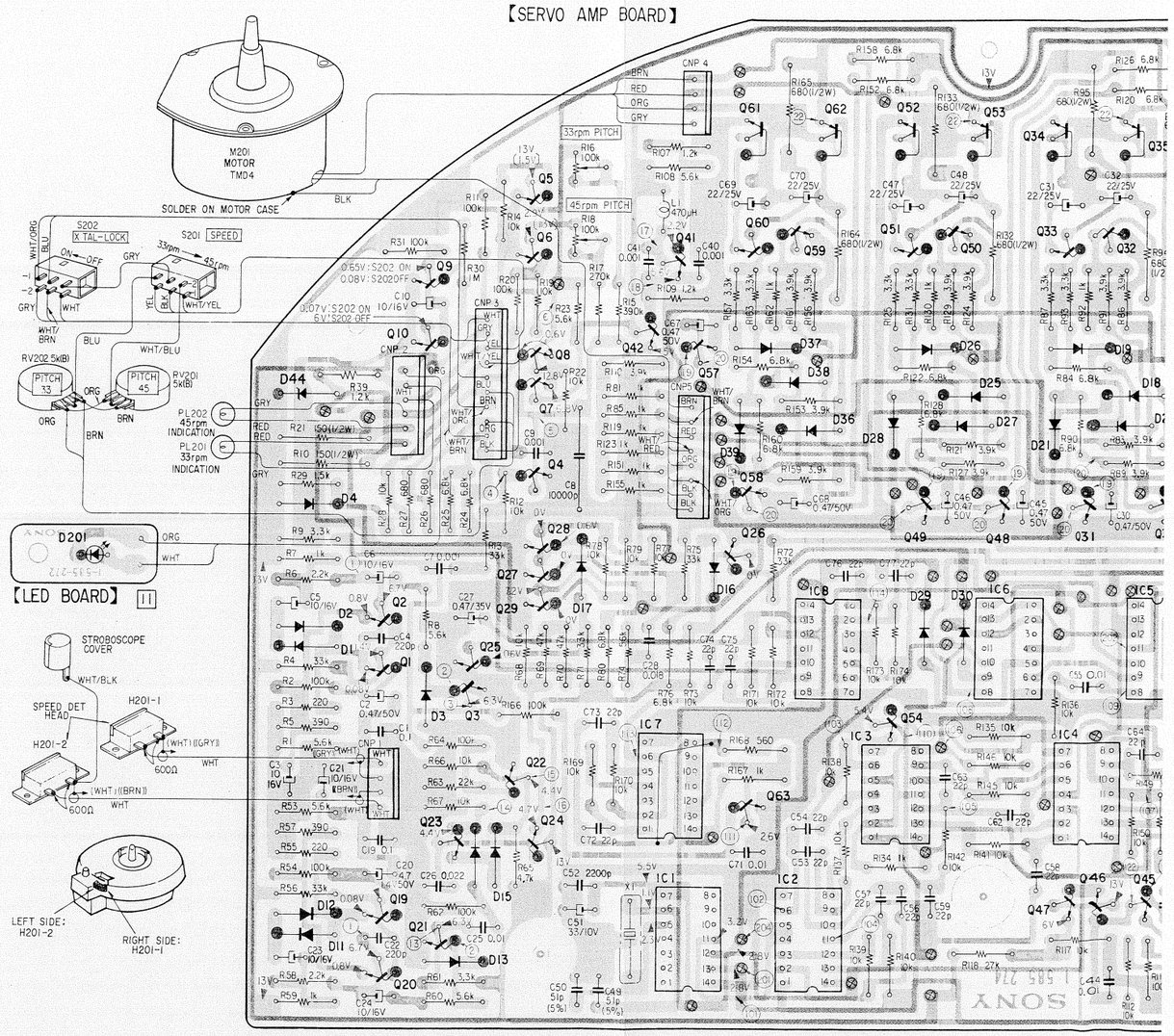


- ▒▒▒ : component-side pattern
- ▒▒▒ : B+pattern
- ⊗ : Through hole.
- Color code of sleeving over the end of the jacket.



- Readings are taken with a 20,000 ohm-per-volt VOM.
  no mark or no parenthesis : 33 rpm
  { } : stop
  [ ] : 45 rpm
  < > : first time of start
  ● : when no touching to S203.
  ▲ : when touching to S203.

【SERVO AMP BOARD】



| | | |

d of the jacket.

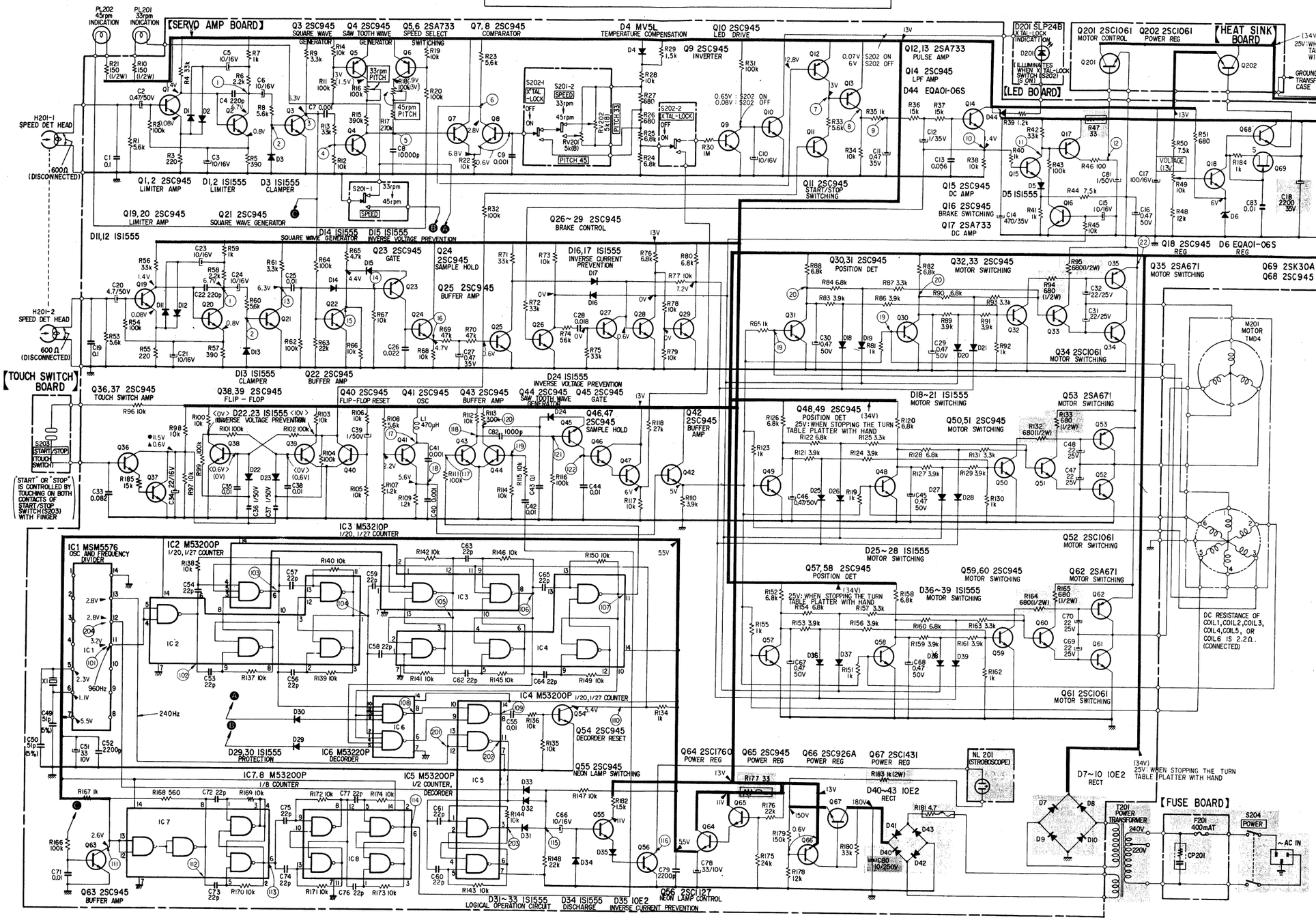
ohm-per-volt VOM.

o S203.
203.

| | | |

4-1. SCHEMATIC DIAGRAM

TTS-8000 TTS-8000



- ▬▬ : B+bus.
- ▭ : panel designation.
- ▭ : adjustment for repair.
- ⏚ : direct connection to points marked ⏚ on the chassis.
- ⏚ : chassis ground.
- All capacitors are in μF unless otherwise noted. pF=μμF. 50WV or less are not indicated except for electrolytics.
- ▭ : fusible resistor.

- Voltage variations may be noted due to normal production tolerances.
- DC resistance of speed detecting head (H201-1 or H201-2) measurements are with coils disconnected from circuit board.
- DC resistance of motor coil (1) to coil (6) measurements are with coils connected on the circuit board.
- Circled numbers (1) to (22) refer to waveforms shown on page.
- All resistors are in ohms. ¼W unless otherwise noted. kΩ = 1000Ω, MΩ = 1000 kΩ
- (2%) and (5%) indicates component tolerance.

- Readings are taken with a 20,000 ohm-per-volt VOM.

no mark or no parenthesis : 33 rpm
( ) : stop
[ ] : 45 rpm
< > : first time of start
● : when no touching to S203.
▲ : when touching to S203.

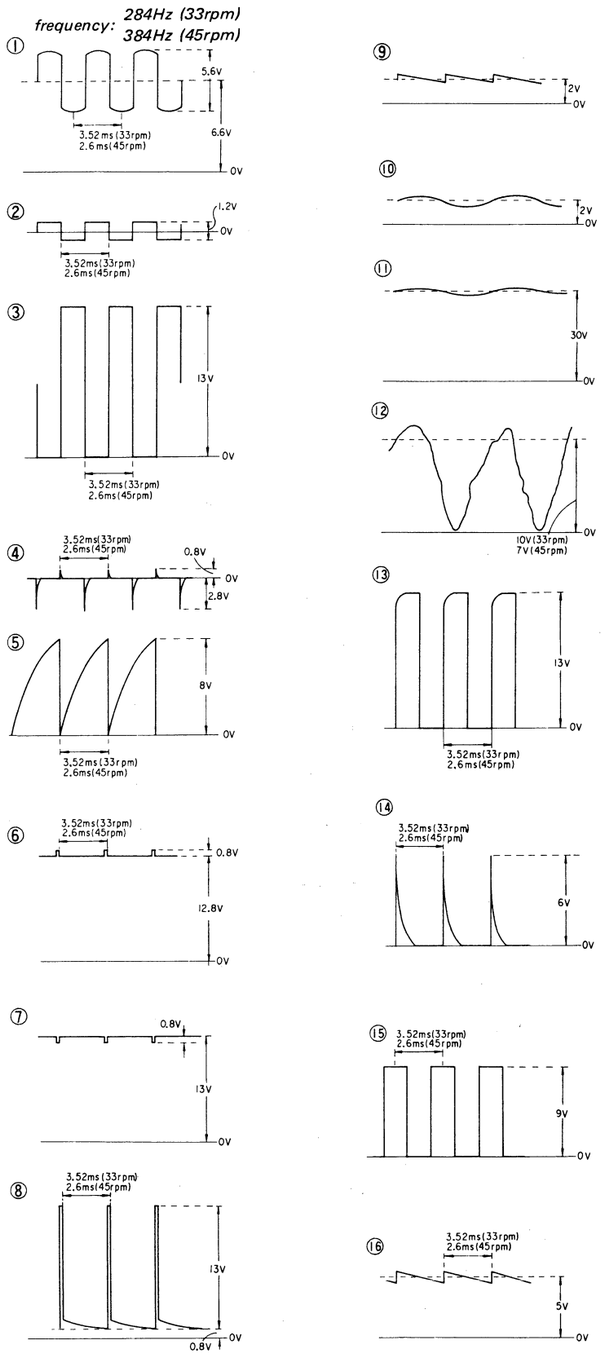
- Switch

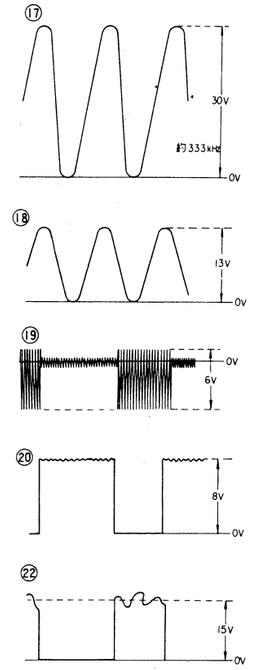
Ref. No.	Switch	Position
S201	SPEED	33 rpm
S202	X TAL-LOCK	OFF
S203	START/STOP (TOUCH SWITCH)	
S204	POWER	OFF

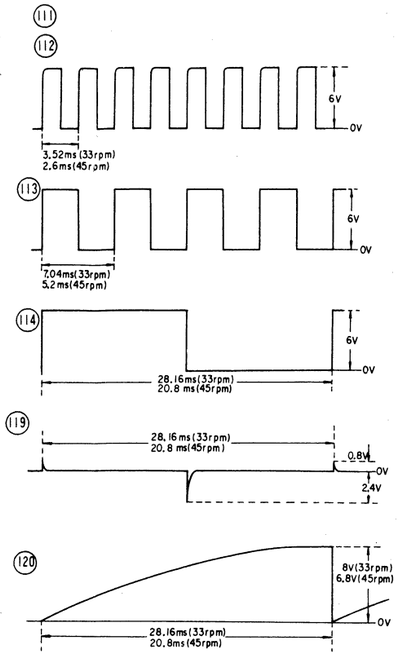
Note:

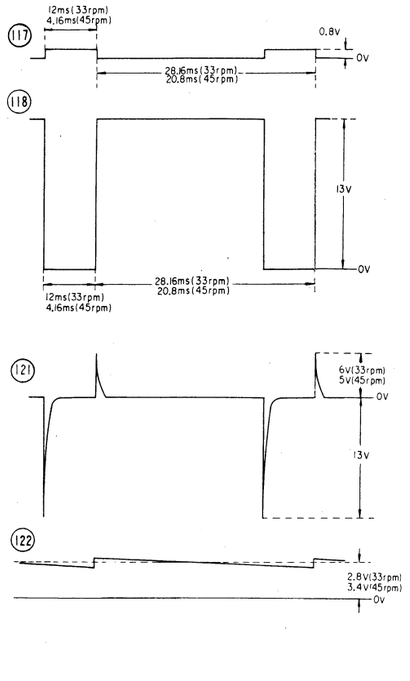
Note: The components identified by shading are critical for safety. Replace only with part number specified.

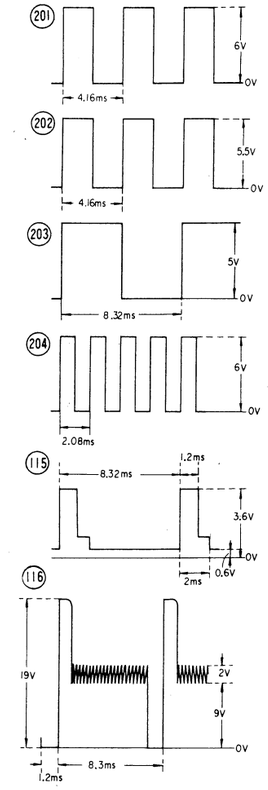
Wave of the speed detecting head (H201)

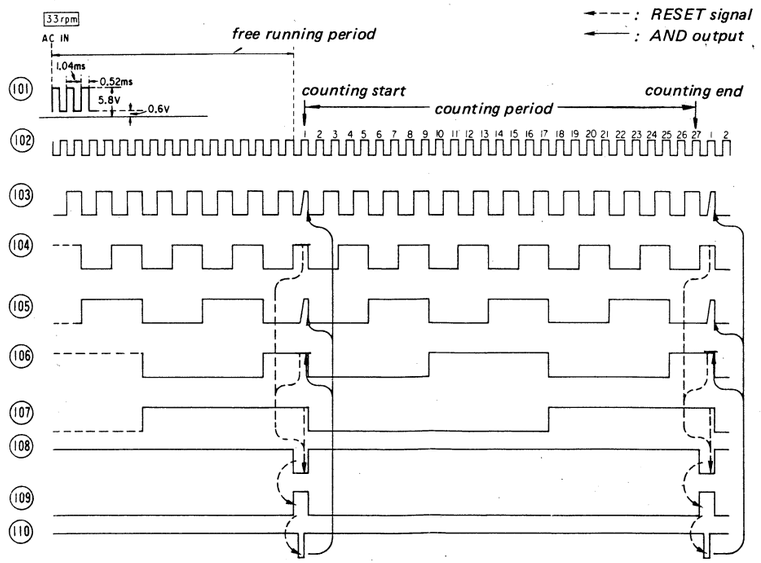

frequency: 284Hz (33rpm)
384Hz (45rpm)
① 5.6V 6.6V 0V 3.52ms(33rpm) 2.6ms(45rpm)
② 1.2V 0V 3.52ms(33rpm) 2.6ms(45rpm)
③ 13V 0V 3.52ms(33rpm) 2.6ms(45rpm)
④ 3.52ms(33rpm) 2.6ms(45rpm) 0.8V 0V 2.8V
⑤ 8V 0V 3.52ms(33rpm) 2.6ms(45rpm)
⑥ 3.52ms(33rpm) 2.6ms(45rpm) 0.8V 12.8V 0V
⑦ 0.8V 13V 0V
⑧ 3.52ms(33rpm) 2.6ms(45rpm) 13V 0V 0.8V
⑨ 2V 0V
⑩ 2V 0V
⑪ 30V 0V
⑫ 10V(33rpm) 7V(45rpm) 0V
⑬ 13V 0V 3.52ms(33rpm) 2.6ms(45rpm)
⑭ 3.52ms(33rpm) 2.6ms(45rpm) 6V 0V
⑮ 3.52ms(33rpm) 2.6ms(45rpm) 9V 0V
⑯ 3.52ms(33rpm) 2.6ms(45rpm) 5V 0V

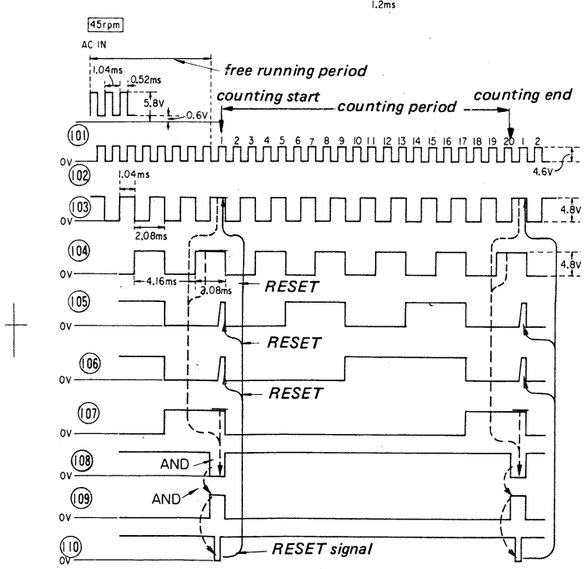



⑪
⑫ 6V 0V 3.52ms(33rpm) 2.6ms(45rpm)
⑬ 6V 0V 7.04ms(33rpm) 5.2ms(45rpm)
⑭ 6V 0V 28.16ms(33rpm) 20.8ms(45rpm)
⑲ 28.16ms(33rpm) 20.8ms(45rpm) 0.8V 0V 2.4V
⑳ 8V(33rpm) 6.8V(45rpm) 0V 28.16ms(33rpm) 20.8ms(45rpm)

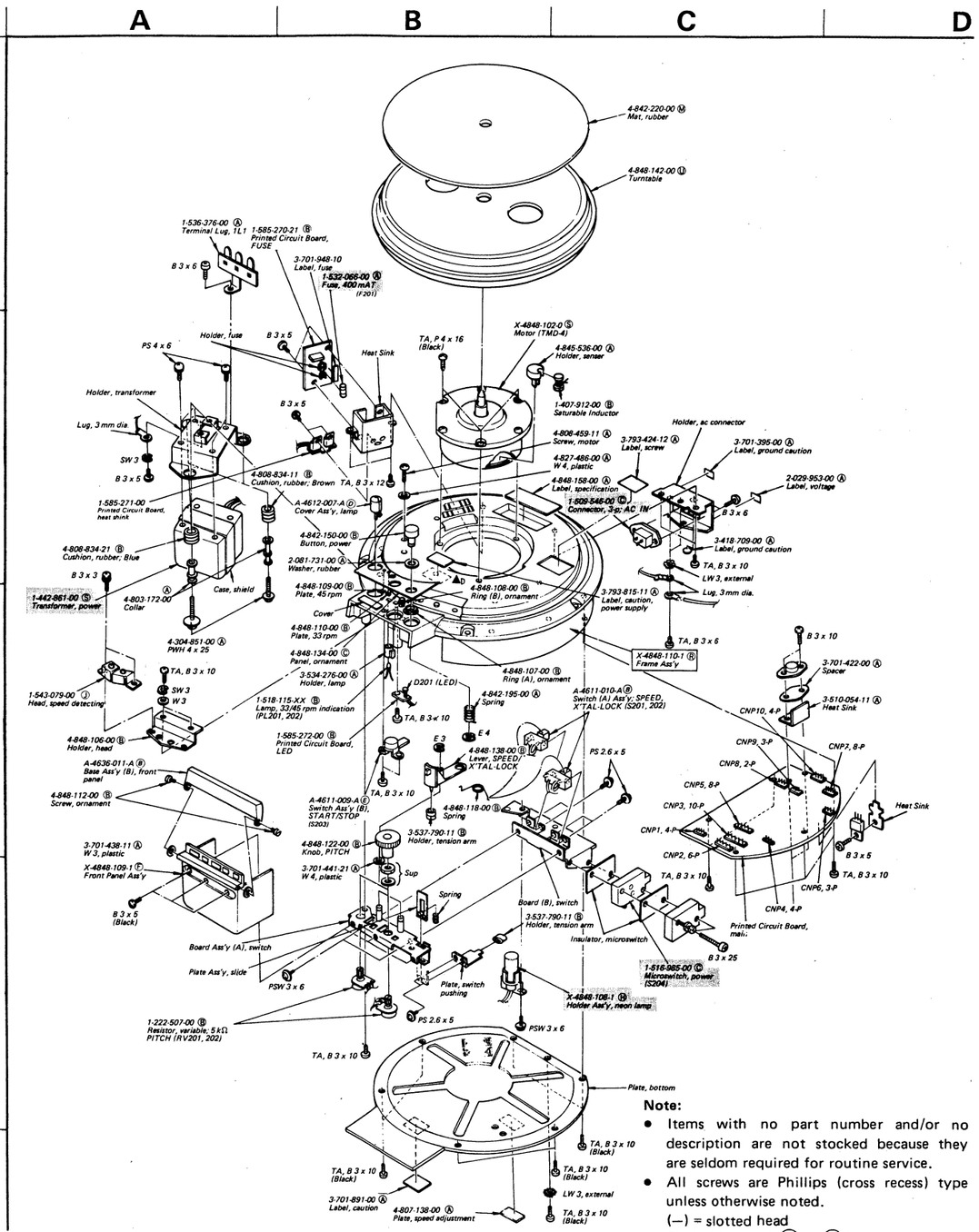

⑰ 12ms(33rpm) 4.16ms(45rpm) 0.8V 0V 28.16ms(33rpm) 20.8ms(45rpm)
⑱ 13V 0V 12ms(33rpm) 4.16ms(45rpm) 28.16ms(33rpm) 20.8ms(45rpm)
㉑ 6V(33rpm) 5V(45rpm) 0V 13V
㉒ 2.8V(33rpm) 3.4V(45rpm) 0V







SECTION 5
EXPLODED VIEWS



Note:
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Note: The components identified by shading are critical for safety. Replace only with part number specified.

SECTION 6
ELECTRICAL PARTS LIST

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.	Description
		PRINTED CIRCUIT BOARDS
	1-585-270-21	Ⓑ FUSE
	1-585-271-00	Heat Shink
	1-585-272-00	Ⓐ LED
		SEMICONDUCTORS
		Transistors
⇒ Q1~4		Ⓑ 2SC634A
⇒ Q5,6		Ⓒ 2SA678
⇒ Q7~11		Ⓑ 2SC634A
⇒ Q12, 13		Ⓒ 2SA678
⇒ Q14~16		Ⓑ 2SC634A
⇒ Q17		Ⓒ 2SA678
⇒ Q18~33		Ⓑ 2SC634A
Q34		Ⓓ 2SC1061
Q35		Ⓔ 2SA671
⇒ Q36~51		Ⓑ 2SC634A
Q52		Ⓓ 2SC1061
Q53		Ⓔ 2SA671
⇒ Q54,55		Ⓑ 2SC634A
Q56		Ⓓ 2SC1127
⇒ Q57~60		Ⓑ 2SC634A
Q61		Ⓓ 2SC1061
Q62		Ⓔ 2SA671
⇒ Q63		Ⓑ 2SC634A
Q64		Ⓒ 2SC1760
⇒ Q65		Ⓑ 2SC634A
Q66		Ⓓ 2SC926A
Q67		Ⓔ 2SC1431
⇒ Q68		Ⓑ 2SC634A
Q69		Ⓑ 2SK30A
Q201,202		Ⓓ 2SC1061
IC1		Ⓛ MSM5576
IC2		Ⓔ M53200P
IC3		Ⓔ M53210P
IC4,5		Ⓔ M53200P
IC6		Ⓒ M53220P
IC7,8		Ⓔ M53200P

Ref. No.	Part No.	Description
		Diodes
D1~3		Ⓑ 1S1555
D4		Ⓐ MV5L
D5		Ⓑ IS1555
⇒ D6		Ⓑ EQB01-06
D7~10		**Ⓑ 10E2**
D11~34		Ⓑ 1S1555
D35		Ⓑ 10E2
D36~39		Ⓑ 1S1555
D40~43		**Ⓑ 10E2**
⇒ D44		Ⓑ EQB01-06
D201		Ⓒ SLP24B
		COIL
L1	1-407-661-XX	Ⓐ 470μH, microinductor
		TRANSFORMER
T201	**1-442-861-00**	**Ⓢ Power**

CAPACITORS

All capacitors are in μF and ceramic unless otherwise noted. 50 WV or less are not indicated except for electrolytics. pF = μμF, elect = electrolytic

C1	1-108-251-12	Ⓐ 0.1		mylar
C2	1-121-726-11	Ⓐ 0.47	50V	
C3	1-121-651-11	Ⓐ 10	16V	
C4	1-102-110-11	Ⓐ 220		ceramic
C5,6	1-121-651-11	Ⓐ 10	16V	
C7	1-108-227-12	Ⓐ 0.001		mylar
C8	1-130-043-11	Ⓔ 10000P		polyethylen ±2%
C9	1-108-227-12	Ⓐ 0.001		mylar
C10	1-121-651-11	Ⓐ 10	16V	
C11	1-131-213-11	Ⓑ 0.47	35V	tantalum
C12	1-131-215-11	Ⓑ 1	35V	tantalum
C13	1-108-361-12	Ⓐ 0.056		mylar
C14	1-121-983-11	Ⓒ 470	35V	
C15	1-121-651-11	Ⓐ 10	16V	
C16	1-121-726-11	Ⓐ 0.47	50V	
C17	1-121-415-11	Ⓑ 100	16V	
C18	**1-121-984-11**	**Ⓓ 2200**	**35V**	
C19	1-108-251-12	Ⓑ 0.1		mylar
C20	1-121-395-11	Ⓐ 4.7	25V	
C21	1-121-651-11	Ⓐ 10	16V	

Note: The components identified by shading are critical for safety. Replace only with part number specified.

- ⇒ : Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	*Part No.*		*Description*		
C22	1-102-110-11	Ⓐ	220P		ceramic
C23,24	1-121-651-11	Ⓐ	10	16V	
C25	1-108-239-12	Ⓐ	0.01		mylar
C26	1-108-242-12	Ⓐ	0.022		mylar
C27	1-131-213-11	Ⓑ	0.47	35V	tantalum
C28	1-108-358-12	Ⓐ	0.018		mylar
C29,30	1-121-726-11	Ⓐ	0.47	50V	
C31,32	1-121-480-11	Ⓐ	22	25V	
C33	1-108-239-12	Ⓐ	0.01		mylar
C34	1-121-479-11	Ⓐ	22	16V	
C35	1-108-239-12	Ⓐ	0.01		mylar
C36,37	1-123-228-11	Ⓑ	1	50V	
C38	1-108-239-12	Ⓐ	0.01		mylar
C39	1-121-391-11	Ⓐ	1	50V	
C40,41	1-108-555-12	Ⓐ	0.001		mylar
C42	1-108-239-12	Ⓐ	0.01		mylar
C43	1-108-251-12	Ⓑ	0.1		mylar
C44	1-108-239-12	Ⓐ	0.01		mylar
C45,46	1-121-726-11	Ⓐ	0.47	50V	
C47,48	1-121-480-11	Ⓐ	22	25V	
C49,50	1-102-491-11	Ⓐ	51P		
C51	1-131-195-11	Ⓑ	33	10V	tantalum
C52	1-101-919-11	Ⓐ	0.0022		
C53,54	1-102-967-11	Ⓐ	22P		ceramic
C55	1-108-239-12	Ⓐ	0.01		mylar
C56~65	1-102-959-11	Ⓐ	22P		ceramic
C66	1-121-651-11	Ⓐ	10	16V	
C67,68	1-121-726-11	Ⓐ	0.47	50V	
C69,70	1-121-480-11	Ⓐ	22	25V	
C71	1-108-239-12	Ⓐ	0.01		mylar
C72~77	1-102-967-11	Ⓐ	22P		ceramic
C78	1-131-195-11	Ⓑ	33	10V	tantalum
C79	1-101-919-11	Ⓐ	0.0022		
C80	1-121-262-11	Ⓑ	10	250V	
C81	1-121-391-11	Ⓐ	1	50V	
C82	1-101-001-11	Ⓐ	0.001		
C83	1-161-032-11	Ⓐ	0.01		ceramic boundery layer

Ref. No.	*Part No.*		*Description*		
			RESISTORS		
			All resistors are in ohms. Common ¼ W carbon resistors are omitted. Check schematic diagram for values.		
R10	1-202-553-11	Ⓐ	150	½W	composition
R15	1-213-201-11	Ⓑ	390k	¼W	metal oxide
R16	1-224-255-XX	Ⓒ	100k		adjustable
R17	1-213-201-11	Ⓑ	390k	¼W	metal oxide
R18	1-224-255-XX	Ⓒ	100k		adjustable
R21	1-202-553-11	Ⓐ	150	½W	composition
R24,25	1-213-198-11	Ⓑ	6.8k	¼W	metal oxide
R28	1-213-199-11	Ⓑ	10k	¼W	metal oxide
R47	1-217-393-11	Ⓑ	33	¼W	fuse
R49	1-224-252-XX	Ⓒ	10k		adjustable
R94,95 R132,133 R164,165	1-202-569-11	Ⓐ	680	½W	composition
R177	1-217-393-11	Ⓑ	33	¼W	fuse
R181	1-212-849-11	Ⓐ	4.7	¼W	fuse
R183	1-206-664-11	Ⓐ	1k	2W	metal oxide
RV201,202	1-222-507-00	Ⓑ	5k		variable; PITCH
			SWITCHES		
S201,202	A-4611-010-A	Ⓑ	Switch (A) Ass'y, SPEED, X'TAL-LOCK		
S203	A-4611-009-A	Ⓔ	Switch (B) Ass'y, START/STOP		
S204	1-516-985-00	Ⓒ	Microswitch, POWER		
			MISCELLANEOUS		
CP201	1-101-534-31	Ⓒ	Encapsulated Component, C-R		
F201	1-532-066-00	Ⓑ	Fuse, 400 mAT		
H201	1-543-079-00	Ⓙ	Head, speed detecting		
NL201	X-4848-108-1	Ⓗ	Holder Ass'y, neon lamp		
M201	X-4848-102-0	Ⓢ	Motor Ass'y, TMD-4		
	including;				
	1-407-912-00	Ⓑ	Microinductor, 470μH		
PL201,202	1-518-115-XX	Ⓑ	Lamp, 33/45 rpm indication; 6V 35mA		
X-1	1-527-903-00	Ⓘ	X'tal, osc		
	1-407-912-00	Ⓑ	Saturable Inductor		
	1-509-546-00	Ⓓ	Connector, 3-p; AC IN		
	1-535-100-00	Ⓐ	Faston Reseptacle		
	1-536-378-XX	Ⓐ	Terminal Lug, 1L1		

Note: The components identified by shading are critical for safety. Replace only with part number specified.

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

ACCESSORIES & PACKING MATERIALS

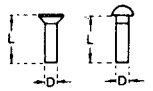
Part No.	*Description*
X-4845-105-0	Ⓢ Cushion (A) Ass'y
X-4848-107-0	Ⓒ Cushion (C) Ass'y
X-4848-113-0	Carton Ass'y
X-4848-114-0	Ⓔ Cushion (D) Ass'y
1-534-819-00	Ⓖ Cord, power
3-701-630-00	Ⓐ Bag, plastic
3-780-991-11	Ⓚ Manual, instruction
3-780-867-11	Ⓐ Manual, instruction
3-794-008-11	Ⓔ Leaflet, mounting diagram
3-849-790-00	Ⓑ Bag, protection
4-808-461-00	Ⓔ Adaptor, 45 r.p.m.
4-848-145-00	Ⓒ Bag, protection
4-848-146-00	Ⓑ Sheet, protection
4-848-153-00	Ⓑ Washer, ornament
4-848-153-00	Ⓐ Bag, plastic
4-848-157-00	◯ L-shaped Hexagonal Wrench

Note: The components identified by shading are critical for safety. Replace only with part number specified.

HARDWARE NOMENCLATURE

Screw: – P 3 x 10

- *L: Length in mm*
- *D: Diameter in mm*
- *Type of head*
- *Indicated slotted-head only. Unless otherwise indicated, it means cross-recessed head (Phillips type).*



Nut, Washer, Retaining ring:

N 3

- *Diameter of usable screw or shaft*
- *Reference designation*

Reference Designation	Shape	Description	Remarks
		SCREWS	
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
		SELF-TAPPING SCREWS	
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
		SET SCREWS	
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
		NUT	
N		nut	
		WASHERS	
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
		RETAINING RINGS	
E		retaining ring	
G		grip-type retaining ring	

9-958-349-11

Sony Corporation
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7D0216-1
Printed in Japan